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## **MATH / STAT 414: INTRODUCTION TO PROBABILITY THEORY**

**Spring 2018**

**Prerequisites: Math 230 or 231**

### **COURSE DESCRIPTION:**

Math / Stat 414 uncovers the mathematical machinery behind core probabilistic concepts and properties. The main topics we will discuss are

- Combinatorial analysis
- Axioms of Probability
- Conditional Probability and Independence
- Random Variables
- Continuous Random Variables
- Jointly Distributed Random Variables
- Properties of Expectation
- Limit Theorems

### **COURSE GOALS:**

- Students will demonstrate understanding of concepts from probability theory related to the above list, and successfully apply them to solve a variety of problems.

### **INSTRUCTOR:**

- **Name and office** Dr. Daisy Philtron; 422B Thomas Building
- **Office Hours:** Wednesday, 1:30—2:30

### **TEACHING ASSISTANT:**

- **Name and office:** TBA
- **Office Hours:** TBA

**WEBSITE (Canvas):** contains all course materials

### **ROOM AND TIMES:**

- Tuesday and Thursday: 102 Leonhard Building, 1:35—2:50 pm

### **CLASS INFORMATION AND REQUIRED MATERIALS:**

- **Textbook:** [A First Course in Probability](#), 9<sup>th</sup> edition, by Sheldon Ross. Please do not buy earlier editions as the homework problems are different.
- Course materials and announcements/communications will be posted in Canvas. Some announcements may take place in class. You are responsible for all announcements and supplementary materials provided on Canvas or in class.

### SUMMARY OF COURSE REQUIREMENTS AND GRADING:

Requirement	Total Percent of Grade	Date
Calculus pre-test	1%	Due Jan 12, noon.
Homework Assignments	25%, drop lowest	Weekly
Mid-term Exam 1	22%	February 8, in-class
Mid-term Exam 1	22%	March 22, in-class
Final Exam	30%	During Finals week

### GRADE CUTOFFS:

In order to be guaranteed a specific final grade, you must achieve the following minimum percentiles:

Final Grade	Percentage Needed
A	93%
A-	90%
B+	87%
B	82%
B-	80%
C+	75%
C	70%
D	60%

### GRADING APPEALS:

- From the day that any graded material is returned, you have one week to bring any errors in grading to my attention. After that no grade adjustments will be made.

### COURSE REQUIREMENTS AND GRADING:

- **Calculus pre-test**
  - You need calculus for this course. The calculus pre-test is required and will be conducted in Canvas on your own time outside of class before noon on January 12.
  - You are expected to review one-variable calculus before taking the pre-test.
- **Homework:**
  - Must be submitted at beginning of class; specific due dates available on Canvas
  - Write your name and course number (414) legibly at the top of the first page
  - Multiple pages must be stapled for full credit.
  - Write/type the completed homework problems in the order they were assigned.
  - Show all work for full credit.
  - Collaboration on homework is accepted/encouraged, but do not copy homework; your answers must still be your own.
  - If you do not turn in your assignment at the beginning of class your assignment will be considered late. You have until 4:30pm the same day to get your assignment into my mailbox in 325 Thomas. After that it will be scored as 0.
  - Do not turn in assignments anywhere outside of class and my mailbox.
  - Lowest homework grade will be dropped at the end of the semester.

- **Midterm Exams (2)**
  - During class on February 8 and March 22
  - Cumulative, but focused on material covered since the previous exam.
  - A mix of multiple choice and short answer problems
  - Exams are closed book. Calculators and one page of handwritten notes will be allowed on standard printer paper (8.5 by 11).
  - Must bring PSU ID card
- **Final Exam:**
  - Comprehensive but with larger weight for more recent topics.
  - Closed book; can bring 2 one-sided sheets of handwritten notes (8.5 by 11).
  - The exact time and date of the final will be announced mid-semester. Do not plan any travel until after the final exam.

**MAKE-UP POLICY:**

- No make-ups will be granted for any reason other than university-excused reasons.
  - An official university excused activity
  - Serious illness
  - Serious negative personal or family problem
  - Attending a religious holiday service
- Documentation will be required and your professor must be notified as early as possible. Notification received after the exam/due date is too late and no make-up will be granted.

**OTHER COURSE POLICIES:**

- Class attendance is not mandatory, however this course moves incredibly quick and notes are not provided. Students must be in class to take notes, or must get notes from classmates if they miss a day.
- No extra credit will be available.

*Our classroom is an environment of focused learning, free of unnecessary distractions:*

- Do not pack your bags before class is over. We have a contract – I don't keep you over time, and you don't try to leave early.
- Although tardiness is strongly discouraged, if you arrive late please enter as quietly as possible and take the seat nearest to the entrance.
- Cell phones must be on silent or powered off during lecture and exams. You will be asked to leave if your phone goes off during an exam (this includes phones on vibrate).
- No laptops or screens allowed if they distract your classmates – tablets are acceptable if they are kept flat on your desk for the most part.
- Drink coffee if you need to... but stay awake during class!

## **COURSE AGREEMENT:**

This syllabus serves as an agreement that begins on the first day of class & ends upon completion of the final exam.

With this course, you are responsible for:

- anything discussed in class and posted on **Canvas**
- coming to the class prepared to learn & finding enough time to make the appropriate commitment
- seeking appropriate and *timely* help if having problems
- following course policy which states that:
  1. final grades will **not** be changed for purposes of maintaining financial aid and/or academic progress or entrance into an academic program.
  2. all exams and quizzes must be taken during the scheduled time unless accommodations are arranged in advance.
- accepting that grades will be based on understanding of material (not just on attendance).

## **PENN STATE PRINCIPLES: SHOULD FOLLOW WHILE AT PENN STATE**

- I will respect the dignity of all individuals within the Penn State Community
- I will practice academic integrity
- I will demonstrate social and personal responsibility
- I will be responsible for my own academic progress and agree to comply with all University policies

**ACADEMIC INTEGRITY AND MUTUAL RESPECT:** All Penn State policies regarding ethics and honorable behavior apply to this course. Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. All University policies regarding academic integrity apply to this course. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. For any material or ideas obtained from other sources, such as the text or things you see on the web, in the library, etc., a source reference must be given. Direct quotes from any source must be identified as such.

Any instances of academic dishonesty WILL be pursued under the [University and Eberly College of Science regulations](#) concerning academic integrity. For more information on academic integrity, see [Penn State's statement on plagiarism and academic dishonesty](#) .

[The Eberly College of Science Code of Mutual Respect and Cooperation](#) embodies the values that we hope our faculty, staff, and students possess and will endorse to make The Eberly College of Science a place where every individual feels respected and valued, as well as challenged and rewarded.

**DISABILITIES ACCOMMODATION STATEMENT:** Penn State welcomes students with disabilities into the University's educational programs. University Park campus has an office for students with disabilities. For further information, please visit the Student Disability Resources Web site: <http://equity.psu.edu/student-disability-resources>.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office, participate in an intake interview, and provide documentation: <http://equity.psu.edu/student-disability-resources/applying-for-services>. If the documentation supports your request for reasonable accommodations, the disability service office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

**COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS):** Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

[Counseling and Psychological Services at University Park \(CAPS\): 814-863-0395](#)

Counseling and Psychological Services at [Commonwealth Campuses](#)

Penn State Crisis Line (24 hours/7 days/week): [877-229-6400](tel:877-229-6400)

Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

**CAMPUS EMERGENCIES:** Campus emergencies, including weather delays, are announced on Penn State Live and communicated to cellphones, email, the Penn State Facebook page, and Twitter via PSUTXT (to sign up, please see <http://psutxt.psu.edu>).

This syllabus is subject to change. Any changes shall be distributed to students in writing through the Canvas course management system.

### SCHEDULE (approximate)

Week	Dates	Sections in book (approximate)
1	Jan 8—12	1.1—1.5
2	Jan 15—19	2.1—2.5
3	Jan 22—26	3.1—3.3
4	Jan 29—Feb 3	3.3—3.5
5	Feb 5—9	Review/4.1—4.2; Midterm exam 1
6	Feb 12—16	4.3—4.6
7	Feb 19—23	4.7—4.9
8	Feb 26—Mar 2	5.1—5.4
<b>SPRING BREAK</b>	Mar 5—9	
9	Mar 12--16	5.5—5.7
10	Mar 19--23	Review/6.1—6.2; Midterm exam 2
11	Mar 26--30	6.3—6.6
12	Apr 2—6	6.6—6.7; 7.1—7.3
13	Apr 9—13	7.3—7.6
14	Apr 16—20	7.6—7.7; 8.1—8.3
15	Apr 23—27	8.3—8.4; review
<b>FINALS</b>	TBD	